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Volunteers to digest journals are invited. All are read retroactively as from October 1st, 1940 to ensure complete coverage. An index of contents will appear annually, summaries and basic bibliographies occasionally.

AGAIN: INTEGRATION IS THE NEED

Editorial Summary.

The discovery of scientific method was a critical gain by European mankind. But have we not just about completely lost control over an older domain no less valuable for humanity's welfare, while we conquered the new area ? What is the good of winning a position, if we lose the battle ?

We moderns do not keep everything in proportion, and all departments of human thought in contact, as the pre-scientific ages could do. We have even abandoned the basic technique for this. People otherwise cultured often are no longer philosophers, and many scientists feel they have no obligations in this respect. Philosophy itself has become a matter of intellectualism. Ontology and epistemology et hoc genus omne have become of late almost infinitely more hopeless technical problems because they have to grapple with so much that science has lately provided.

Then there is the over-weighted importance of physics and mathematics in all thought. Biology, it is true, is asserting its rights. But psychology is very laggard. It is no longer a prisoner to materialism, but many psychologists are unaware the jail has been dissipated into thin air, and that the jailer is dead.

It is of the greatest importance to recognize the need to regain the whole, the proportionate view. Before ontology and epistemology can have sound meaning a preliminary stage of survey is required. A kind of surveying philosopher must come into existence. It is beyond all hope for one brain to encompass all data. But it is easy for one thoughtful person to identify and relate established laws, if they be put simply to him by the experts.

We are often entertained by notions of the pre-scientific era. Yet a certain doubt is stealing over us that while we are in the way of knowing everything, we are coming to understand less---and, what is worse, that our local knowledge of parts may be positively a menace because it is not accompanied by a constant recovery of the whole. "Some of the old therapeutic customs that seemed ridiculous in the dawn of this scientific age have since been found to have basis in sound fact. The feeding of ashes of burnt sponges to persons suffering from goiter is now recognized as effective, if a bit crude, because of the high content of iodine in the ash. The Chinese use of the skin of the head of a toad for staunching wounds seemed most revolting until a considerable content of adrenalin was demonstrated therein. Another old custom, the taking of sulfur and molasses as a spring tonic, now appears to have similar scientific justification. While the usefulness of the sulfur part of the combination remains to be proved, the molasses part has been found to provide dietary supplements needed particularly after the depletions of the winter." (Industrial Bulletin of Arthur D. Little, Inc., July, 1941)

Renewal subscriptions to the second volume of MAIN CURRENTS will be welcome now, and are due in October. We ask colleagues to be as generous as they find it possible to be during these formative months of our venture.

F.K.

Suppose that hundred years hence we find out that tonsils are useful, or that certain types of immunization have had profoundly disturbing effects on basic metabolism, and so on. Will our contemporary science look then like outmoded superstition, that is, folk customs? If so, why ? Surely because we in our time are not really scientific in an over-all sense.

These are by no means idle questions. On the contrary, they are of supreme urgency to mankind. An illustration is in order. In the building up of what is called immunity we are dealing with living tissues that have purposes of their own, and while we treat them as if they were chemicals they act as if they are adaptive life process---which they are, of course ! We know, for instance, of the use of sprays for killing insects and the development after a time of an immunity to the particular poison by the insects. Then there is the treatment of body sores by carbolic acid derivatives, until after a time no further healing occurs, an immunity to carbolic acid is built up, and recourse must be made to chlorine derivatives in order to effect further healing.

It is now believed by many cancer research workers that when petroleum products (carcinogenic hydrocarbons) are used to produce cancerous growths, the cells presently actually change their character. Since they cannot any longer function one way, and grow as they are wont, they actually change in order to grow somehow. (See J. W. Cook. F.R.S. in Chemistry and Industry, 60, 242-3, 1941). Again, from the work of Dr. Dwight C. Carpenter, Research Chief of the New York State Agricultural Experiment Station on the irradiation of proteins, it has been demonstrated that absorbed light energy may travel along a chain, passing through two or more intermediate atoms, and open up the weakest bond linkages in a compound, at some distance from the point of absorption of the light energy. (Jour. Frank. Inst. 232, 76, July, 1941)

The growth of bio-chemistry of late years is due to a recognition of the unique character of the chemistry of organic substances in the living creature. We are getting back to the old position of regarding light and life and psychological forces as having over-riding laws superior to physical and chemical laws. But the creation of new departments of science is not enough. In fact there has been too much of it. We need a science above the sciences, integrative philosophy. For no one science can set its own house in order unaided. Anyone acquainted with parapsychology, psychopathology, psychical research, depth psychology, oriental psychology and ganzheit psychology knows that there is not even integration in this one sub-branch of knowledge. When we add animal psychology, confusion mounts. With further enlargement to include human, and then animal, physiology the uncertainty as to basic psycho-biological law is enormous. The tendency is to simplify by ignoring discomforting facts. But it doesn't work. In the Saturday Evening Post of August 9th, Booth Tarkington recounted his family's experience with psychic research. Millions of people are thus provided with columns of reading about a subject which is either nonsense or else the most serious possible. Is Mr. Tarkington in his dotage ? Is the Saturday Evening Post without principles ? Is psychic research just idle study of twitches and twitters ? If one instance of superphysical force (we do not say supernatural) is to be admitted, what of all psychology, all physics, all so-called law ?

Few thinkers contemplate seriously getting hold of an over-all abstract of laws and concepts to frame physics and biology with physiology and psychology---and with them framing also economics, religion and art. Yet this is really the problem of our times. How can we have a world culture without an integration, somewhere, soon, of the whole body of natural law ? F. K.

C. Reinold Noyes, writes in Political Science Quarterly, December 1940:-

"Everywhere one looks today over the field of current legal scholarship one sees evidences, if only scattered, of an earnest desire and a diligent effort to apply to this the most traditional of all social arts that method for advancement of understanding which we have come to associate with the modern science. Until recently this movement was most conspicious on the Continent, less so in England. Today, its most promising, if not its most advanced, sector seems to be in the United States.

"To one, like myself, whose training has been in the 'exact sciences', and who views this movement as a part of the general drive to apply the methods of these exact sciences to the whole subject of society, the somewhat toddling first steps in the field of law are most sympathetic.

"It becomes, therefore, a matter of deep concern to such an outsider when he perceives that progress along this line is being held up, not only by the very real obstacles that are necessarily present, but even more so, on the one hand, by what seems to be a widespread misunderstanding of the nature of scientific method, and, on the other hand, by a conventional view of the character of legal material, which renders it almost incapable of being dealt with by such a method. Since these latter obstacles are wholly unreal and exist only in the minds of those whose ways of thinking have been formed in the peculiarly non-scientific channels of traditional legal training, they are susceptible of being conjured away by treatment. ------

"The fruits of the scientific attitude and method applied to the law will be greatly increased once the present misapprehension as to the nature of the material with which law deals is corrected, and once the lack of interest in the method of 'descriptive science', identifying, naming, defining and classifying on a truly analytic basis, is overcome. From this will result a great clarification of 'expository' jurisprudence. But it will not do to make light of the real obstacles remaining.

"In the first place there is the inherent difficulty, facing bench, bar and student, of determining what actually are or were the 'facts' of the case which is being argued or studied. These 'facts' are usually disputed; and their determination must in the interests of justice, be subject to the rules of evidence and, in the interests of order, be expeditious and final. Neither of these limitations on the technique of observation is conducive to scientific exactitude. But at least such analysis will help to clarify the 'law' of the case. And difficulties in determining the facts face all scientific procedure.

/Another real obstacle is/ "the law is primarily a system of value judgments applied to human conduct. Scientific method can only help...to determine what value judgments should be made. But its great value in this regard is not so much to be an aid in determining what value judgments <u>should</u> be as it is to be a sure prediction what they <u>will</u> be. The chief function of this method is the uncovering of the keys to the preponderant value judgments that are being currently made, and that have been made in the past, so as to permit the inclusion of the keys to these judgments in the criteria of legal classifications and thus to lead in the direction of certainty.

"The essential for complete certainty--the ideal for law-is that each legal classification of facts should be so exactly defined that those who are informed can determine the place in the system in which every specimen they meet in experience belongs, once they have fully ascertained its essential characteristics, and that each set of facts should have a single, sure and definite set of legal consequences.

"Though complete attainment of this ideal is obviously quite impossible, nevertheless, by the application of scientific method, the law may at least arrive at as much certainty as is possible with any body of living and evolving subject matter, and the battle between the contending ethics may be brought into the open where it belongs."

SCIENCE IN CIVILIZATION

Separation of the study of Nature from the worship of personal deities was clearly distinguished by such early Greek philosophers as Thales and Pythagoras. When the sun, moon and planets, no longer regarded as personal deities, were divested of divinity and became substance instead of spirit, the essential principles of astrological relationships disappeared.

When Newton showed that the law of gravitation accounted for the movements of the moon, planets and comets, the latter were no longer regarded as warnings sent to the human race.

The concept of a world in which all natural events were believed to be subject to daily supernatural intervention had to be replaced by one in which law and order prevailed. Men began to learn that disease is an "act of God" only in the sense that it is a penalty for their neglect to discover the natural cause for it. Black death is a consoquence of sloth and ignorance, not a sign of divine wrath. For years the "pestilence that walketh in darkness" took its toll in millions of human lives. It was only when the light of scientific knowledge penetrated this gloom and revealed fleas from rats as the carriers of infection, that man found he had in his own hands the means of emancipation from a terrible scourge.

Science is concerned with inquiries into natural causes and consequences and with action based upon them. In Nature, as in civil life, ignorance is no plea against the law.

The object of every scientific investigation is to discover truth and not to awaken consciousness of what good or evil uses may be made of it. Any scientific discovery may be put to evil uses until civilized society recognizes that might is not a measure of right. Progress along this line is slow but the British and Amer. Ass. for the Advancement of Science are now combined in a common high social purpose. As representatives of science, they accept responsibility for the creation of the material aspects of civilization and show their desire to share in the efforts to make aims and peoples worthy of the knowledge they have provided for progressive human development. (Sir Richard Gregory, Bt., F.R.S., formerly editor of Nature in Chemistry and Industry 60, 530-31, 1941. A. J. P.)

MANY-VALUED LOGIC, CONTINUED.

We have previously noted in MAIN CURRENTS that seven years ago Dr. F. Zwicky of Calif. Inst. of Technology declared that he thought it would be easier to explain the atom if he could use a many-valued logic, that is a logic which denies the principle of reductio ad absurbum. In a many-valued logic, instead of two possibilities in a clear and precise statement of "so" and "not so", there are "n" possibilities. A general question such as "Do you favor short skirts for women" might well receive six answers varying from "certainly" to "certainly not". Since Dr. Zwicky's request that mathematicians get busy and develop many-valued logics for use in explaining the atom, some systematic work has been done on the problem.

This work was reported on before a recent meeting of the Amer. Mathematical Society by Professor J. Barkley Rossen of Cornell Univ. The result so far is that

many-valued logic is much more complicated than any one had expected. The reason is that the meaning of every mathematic word depends on the fact that one uses a two-valued logic for ordinary mathematics. Allow more values and you get more meanings for every word. For instance in 3 valued logic there are 256 distinct meanings for the simple word "and". Imagine how many possible kinds of atoms a physicist could make out of electrons and protons with 256 different kinds of "and" to choose from, and how much more chance he would have of finding one that worked the way it ought to. (J. Frank. Inst. 231, 244, March, 1941. A. J. P.)

THE PRINCIPLE OF THE UNOBSERVABLE

After analyzing the concept of the unobservable, Herbert Dingle has reached the conclusion that we must either presume omniscence, or abandon our belief in the external world, if we accept the principle: that which is unobservable is not significant. As the first alternative is untenable, Dingle has faced us with the dilemma of either accepting a form of solipsism or abandoning a principle which has proved to be of great value. Dingle's dilemma is due to his tacit assumption that the principle states a logical proposition. The dilemma disappears if the principle of the unobservable is taken to be what it really is--- an heuristic principle, a useful and convenient rule of action for investigators. (H. M. Dadourian, Trinity College. Phys. Review 60, 172, July 15, 1941. A.J.P.)

TOMORROW A New Monthly Magazine

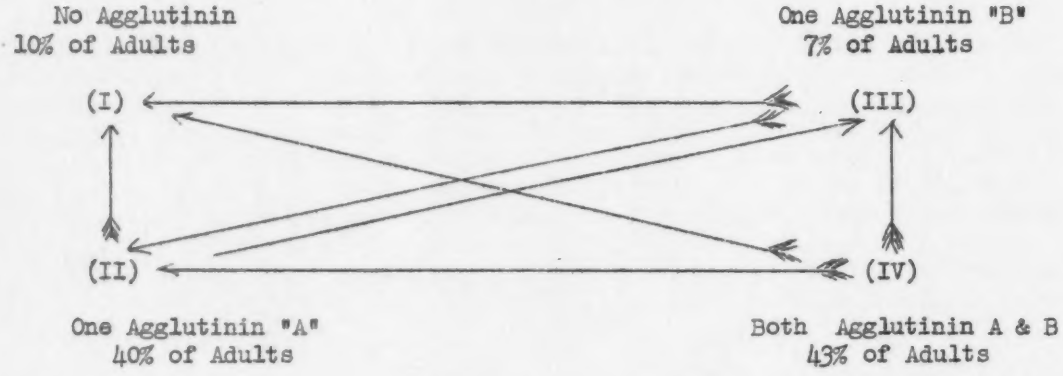
Mrs. Eileen J. Garrett, who is well known in psychic research circles, and as the author of Telepathy, and other writings, has gathered around her a group of colleagues who have launched a new magazine called Tomorrow. It will be examined systematically along with the other source journals for MAIN CURRENTS. But the nature of the enterprise is such as to warrant rather special notice.

The objective appears to be to draw upon conspicuous personalities for articles and reports concerning not the superficial events of the times, but their meaningful content along inner lines. The first issue is almost completely pre-empted by big names such as Andre Maurois, Sir George Dyson, Count Byron de Prorok, Gerald Heard, James Hilton and Sigrid Undset. Topics such as mediumship and mysticism occur along with much material of more commonplace import. The magazine, in short, is not by any means a journal devoted to psychism as an abnormality, but as part of the routine fullness of life. The type, paper and format are all more than acceptable, and the subscription is $2.50 per year in the United States. Until this newcomer is a little older, we venture no serious criticism, but perhaps it is not out of order to suggest that if it is to grow up and be more than just another magazine, an adequate amount of attention must be paid to realistic treatment of the inner mechanics and biology of the universe, and those burning issues which some people call political but which in fact have become today immediate, spiritual and humane.

F. K.

Blood usually contains a substance, agglutinin, and it is believed that there are two distinct types of it. We may call them A and B. No agglutinin occurs in about 10% of American adults, A is found in 40%, B in some 7% and both together in the remainder, 43%. The two agglutinins have a peculiar relation to each other. A will cause the red corpuscles in blood containing B to clump (agglutinate) within the blood stream, and B does the same to corpuscles in blood containing A. Either has this effect on blood containing no agglutinin. This leaves the fourth type of blood, which has both, and which clumps all the others.

RACE TYPES IN THE UNITED STATES



(After Sandford. From "Clinical Diagnosis", J. C. Todd, Saunders, Phila., 1920)

The arrows show the direction of the clumping effect.

From this situation arise the four blood groups of the world. Surveys of the distribution of these types shows that each is found in every race of mankind, but that a given group will have various percentages of the four types. Thus tentative conclusions have been drawn as to earlier and later races. For the blood groups are regarded as basic. External features of all kinds, such as head measurements, are supposed to be less certain for assigning relative antiquity of origin to a group of people. The following item may be clearer in view of the foregoing.

(F.K.)

"The blood grouping of 7 gorillas, 3 chimpanzees and one orang-utan was prompted by the unexpected finding of group B in the circus gorilla, "Gargantua". Only 4 gorillas had been previously reported; these were all group A. The finding for the first time of group B in African anthrapoids renders untenable certain theories regarding the source of group B in African natives and Asiatic apes, involving independent mutations, since these theories were based on the assumption that all gorillas were group A. The tests were performed on samples of urine from the 11 apes, making use of the absorption technique. In two instances it was possible to confirm the results by means of direct tests upon the blood. Certain theoretical objections to the complete acceptance of urine tests as an indication of the blood groups of apes are discussed, and the reasons given for the writer's own acceptance. The implications of these new findings for the problem of the source of group B in African natives and of the ultimate source of the blood groups, are given. The finding of group B in African apes is thought to have some bearing also on the problem of human origins."-- Auth. (courtesy Wistar Bibl. Serv.) Biological Abstracts, January, 1941, #609 - Candela, P. B. New data on the serology of the anthrapoid apes. Amer. Jour. Phys. Anthrop. 27 (2). 209-221. 1940. G. T.

MAN'S PLACE IN NATURE — Biology Items

Biologists have been canvassing a number of topics of absorbing interest in recent years, revised ideas of evolution, biological time in various forms, the nature of control in growth, and so on. More and more evidence appears for superphysical, qualitative, types of explanation, as will be seen from a characteristic item which follows this paragraph. It will also be noticed that the appearance of man in this tertiary geological epoch may be interpreted as a signal to or a sign in Nature as a whole. The significance of data such as this is that man cannot be treated in any manner remotely like the treatment he received in neo-Darwinian thought. Popular literature shows very little signs as yet of being aware of these profound changes of attitude about origins of species. A complete revolution in thought is being prepared under the cover of this war, and may be expected to break with compelling force when a real peace comes. (F. K.)

"Kleinschmidt's definition of the 'Weltformenkreis' as the smallest systematic unit removes the danger of obliterating the type and at the same time opens a way for judging the higher taxonomic groups on a different principle from the subspecies of a 'Formenkreis'. The characters of geographical subspecies ('Rassen') are characters of apparent shaping; those of the species are characters of construction and are qualitative and autonomic. It is the type differentiating in quality that justifies the definition of species. As the characters of type do not necesarily appear gradual and quantitative, but are qualitative, the types cannot be derived from one another, unless they are conceived by the common superordinate idea of the superior systematized category next in order. The distinct division of species is opposed to the hypothetical continuity of the pedigree, which cannot be explained by a consanguinity nor by an affinity based on reproduction. The pedigree is an expression of the spiritual order of nature, in which the types appear as units hierarchically graduated and determined by entelechy, not by dead matter. Within the systematic units there is a creative evolution, from the primitive stage to the differentiated one, beginning with a juvenile phase, followed by orthogenetic maturity and by the aged stage with its 'detypification'. The adaptation to the environment (biotope) may be also proved for primitive forms and is an organic part of the design for them as well as for specialized and differentiated forms. The formation of new types cannot be explained in a mechanical way; everywhere, even in the genes and genoms, we find ingenious modifications, which do not only bring about a reaction of a single modification to the whole, but operate from the whole. Since the origin of man, in the Tertiary, the creation of species has ceased; subsequent alterations are of a subspecific character. After a digression on the fundamental difference between man and animal in order to explain these types, the higher categories are characterized as spiritual realities. It is especially for the genus that revision is necessary. The reality of the common origin of certain species within the genus is not based on reproduction (as is the case in the 'Formenkreis') but on the superior totality comprising the species. Individuals can be conceived by the character of the species, species only by the character of the genus. This is evidence for the methodicalness of creative nature. It excludes any evolution of the genus 'from bottom to top,' which is irregular, accidental or immediately formed by environment. From this we derive the comprehensive basis of a natural system, which now is more than mere classification. (H. Frieling, digesting in Biol. Abst., March, 1941, #3577, his own observations entitled and published as follows: Der Ganzheitsbegriff in der Systematik. Grundsatzliches uber Rasse und Art, sowie Bemerkungen uber Berechtigung und Bedeutung der hoheren systematische Kategorien. Acta Biotheoretica 5 (3):117-138, 1940. G.T.)

TWO REALMS IN EVOLUTION — Basic Biological Thought

Dr. Sewall Wright, professor of zoology, University of Chicago, reviews a chal-

lenging book by B. Goldschmidt (The Material Basis of Evolution) in The Scientific Monthly, August, 1941. Dr. Wright says that while he "radically disagrees with the author's central theses, he wishes to testify to the importance of the book. A great store of well selected data have been assembled from diverse sources, fairly presented and discussed from viewpoints which must be carefully considered by anyone interested in the problem of evolution." The following are further extracts from his review.

"The book is not intended to cover the entire field of evolution. It is an 'inquiry into the types of hereditary differences which might possibly be used in evolution to produce differences between groups.' There are two main parts--- 'Microevolution' (pp. 8-183) and 'Macroevolution' (pp. 184-395)--in accordance with the absolute distinction which Goldschmidt has come to make between evolution within species, and the origin of species and higher categories. He reaches the following conclusions with respect to microevolution."

"Microevolution within the species proceeds by the accumulation of micromutations and occupation of available ecological inches by the pre-adapted mutants. Microevolution, especially geographic variation, adapts the species to the different conditions existing in the available range of distribution. Microevolution does not lead beyond the confines of the species and the typical products of microevolution, the geographical races, are not incipient species. There is no such category as incipient races."

"The reasons given for concluding that the processes which determine microevolution have nothing to do with macroevolution may be summarized briefly as follows: the observed discontinuity of species and higher categories can not be explained without postulating an unreasonable amount of extinction of intermediates; these processes are too slow; they are too limited in scope, since it is inconceivable that mutations of protozoan genes could furnish enough material for the evolution of higher animals, even granting duplication; and finally gene mutations are inadequate in kind."

"The germ plasm as a whole controls a definite reaction system controlled as a whole by one agency."

"As hereditary cytoplasmic differentiation is ruled out as an important factor, the author concludes that only one possibility is left."

"Species and the higher categories originate in single macroevolutionary steps as completely new genetic systems. The genetical process which is involved consists of a repatterning of the chromosomes which results in a new genetic system. The theory of the genes and of the accumulation of micromutants by selection has to be ruled out of this picture. This new genetic system which may evolve by successive steps of repatterning until a threshold for changed action is reached, produces a change in development which is termed a systemic mutation. Thus selection is at once provided with the material needed for quick macroevolution." (R.S.)

THE MATERIAL BASIS OF EVOLUTION, B. Goldschmidt, Illustrated, v 436 pp. $5.00, May, 1940, Yale University Press.

THREE VARIETIES OF CATALYSIS — Bibliographic Note

Notice of the following great work on catalytics is here cited as a matter of record, and also for the significant final phrase, wherein is indicated the growing importance of studying all processes in the living creature upon the basis that here their occurrence is under quite new conditions. In other words, there is straight catalytic action as seen in many familiar inorganic chemical reactions with platinum, etc., there is organic chemical catalysis in substances of living origin but not in the living organism, and finally there is biological catalysis. (F.K.)

"This is truly a monumental work. The present status of the topics included is treated in a comprehensive manner, many references are given, innumerable reactions are described, and the theoretical background stated clearly and satisfactorily. It is manifestly impractical to give a detailed review here, in view of the fact that biological reactions and catalysts of importance in life processes are not included in the plan of this book. Even so, it should be of value to all interested in the mechanism of chemical reactions. Workers in the biological field must necessarily profit by a study of the contents as forming a valuable and useful foundation for an understanding of catalysis, whether the reactions involved are biological in character or organic or inorganic." (K. G. Falk, in Biol. Abst., May, 1941, 10105, noticing Berkman, Sophia, Jacque C. Morrell, Gustav Egloff. Catalysis. Inorganic and organic. xi - 1130 p. Illus. Rheinold Pub. Corp.: N.Y., 1940. Pr. $18.00. G. T.)

THE INDUCTION OF FERTILITY IN GENETICALLY SELF STERILE PLANTS

In hybridization experiments designed for the production of new colors in commercial Petunias, a strain of Golden Rose was discovered that is completely self-sterile under natural conditions. This was found to be due to the slow rate of growth of the pollen tubes and the formation of an abscission layer which severs the style from the ovary before any of the tubes enter the latter. It was found that the self-sterile plants could be made self-fertile by spraying of the flowering plants with a solution of 10 parts of alpha napthalene acetamide in one million parts of water. This solution neutralizes the effects of an ovarian secretion which diffuses into the stylus and inhibits or greatly retards growth of the pollen tubes. Thus it is suggested that a great variety of economically important plants which normally are partly or completely self-sterile may be made self-fertile by the use of a suitable solution of alpha napthalene acetamide. (William H. Eyster, Science 94, 144-5, Aug. 8, 1941. A. J. P.)

VIRUSES AGAIN CHALLENGE US To a New Definition of Life

"The author considers that autonomous movement gives the first clue to the quality of life and shows that irritability and reproduction in their simplest form are not reliable characteristics to separate the living from the non-living. Evidence is quoted to show that virus movement in a tobacco plant is not dependent upon streams of nutrient, water or protoplasm in the host, and it is suggested that the virus is a living organism since it exhibits a type of independent movement through its host which can only be interpreted as autonomous and is also independent in its temperature relations." (E. Oyler in Biol. Abst., March, 1940, #6569 reviewing Grainger, John, Virus and vital organization, Nature (London) 146 (3704): 539-541. 3 fig. 1940. G. T.)

EFFECT OF DIFFERENT ENVIRONMENTS ON CABBAGE HEAD SHAPES

Discussing the Effect of Different Environments on Head Shape in Marion Market Cabbage, W. S. Flory, Jr. & J. C. Walker of the (Tex. Expt. Sta., U.S.D.A., & Univ. Wis.) write: "An analysis of measurements taken on plants propagated from the same lots of seed but grown in Madison, Wis., and Weslaco and College Station, Texas, showed definite effects of the environment on the shape of heads, as indicated by length:width ratios. The heads were somewhat flattened in Wisconsin and distinctly elongated in Texas. Apparently plants selected in a given locality to the point of apparent stability for certain characteristics may become unstable in these respects when transferred to a different environment. The need of adaptation of new varieties during their course of development to the region where they are to be grown is indicated." (Amer. Soc. Hort. Sci. Proc., 36 (1939), PP. 778-782, quoted in Experiment Station Record, February, 1941. P. 186. G. B.)

With increasing knowledge about the vitamins we see a constant recurrence of a tendency to explain human behaviour in bodily and chemical terms. Mother love, it seems, might be just manganese. The trouble with fathers perhaps is that they are deficient in phosphorus.

When the data stand up, we have valuable new information. Much of the material in widely read magazines is sound enough. An article in Collier's Magazine (1939, before MAIN CURRENTS came into existence) discussed interestingly the effect of various diets on rats. Rats were fed on the diet of northern, central and southern Indians. The first group became large, strong and pugnacious. The second group, fed on a rich and spicy diet grew sleek coats and long oily whiskers and became very clever. They fared the best in maze-hunts for food. The third group, fed on the southern Indian diet, became small, weak, furtive and timorous. The conclusion was reached that food (not vitamins) was responsible for the development of character.

Again in Readers' Digest, December, 1940, Dr. Paul de Kruif reported fascinatingly experiments on the feeding of vitamins at Hillman Hospital in Birmingham, Alabama. Cures have been effected on forgetful, weak, crying women. Vitamins have been found effective in cases of insanity, skin diseases, intestinal ailments and nervous breakdowns and again with tired, listless dunces at school. Dr. MacQueen of the Nutrition Clinic is convinced that no class of citizens deserve the name of "poor white trash". Their supposed no goodness is the result of a chemical deficiency.

Walter Pitkin has coined the phrase, "the chemicals which control character", for vitamins. And of course this is correct enough, provided we understand that the control in question is like a screen interposed to respond to something subtler. For there is quite as much information to show that emotions make chemical reactions as there is to show that chemical changes alter morale. Drawing from the same popular sources, we notice in Harpers (Readers' Digest, June, 1939) a report by George W. Gray on anxiety and illness with dramatic accounts from Dr. Flanders Dunbar and associates at the Presbyterian Hospital in New York, Dr. Stanley Cobb at the Massachusetts General Hospital in Boston, and others. An extract will identify the theme. "Dr. Erwin Moos reports the case of a man with a systolic blood pressure of 280, who was also afflicted with a lung disorder, and whose urine showed traces of albumen. Rest and drugs brought no beneficial effect, but one day the patient remarked that he had done great wrong to his estranged wife. The doctor immediately arranged a meeting, and after a friendly discussion between the two, the man's blood pressure fell to 150, his lung symptoms abated, and the albumen disappeared. Several years later the patient was in good health, with a blood pressure of only 130." Mr. Gray concludes by suggesting that as the 19th century brought insight into contagion and created antisepsis, so the 20th may bring knowledge of the psyche and its relation to disease.

Certainly such a gain would be invaluable, but can it be made unless workers everywhere in these fields make up their minds that the psyche is real and as causal as bodily changes are ? We think of what is going on in the minds and emotions of people today. There is said to be a sort of occupational disease in Wall Street circles, heart and other afflictions brought on from systematic hating. In other groups there are basic fears. Has not the time come to teach widely the reality of the psyche as a whole organism ?

The democracies have yet to take the step of becoming the champion of the angels with other than military weapons. German thoroughness, now harnessed to force, must be matched by democratic insight, directed to making a new world.

Germany uses scientific psychology as a military weapon in its army. Even Freudian doctrines have been put to use despite public condemnation of psychoanalysis. This is revealed as the result of a search made by Dr. H. L. Anstacher of Brown University in studying all the available scraps of writing published by the German military psychologists. It is the psychologists who select the commissioned officers and not vice versa. Candidates are evalued on general intelligence, use of will power, planning, attention, clear thinking under stress, energy, perseverance, and ability to command. Facial expression, handwriting and voice are subjected to scrutiny for clues they may give to personality. (Reported in Science News Letter 39, 213, April 5, 1941.)

The Germans are working of course from the physical side as well, with diet, and so on. We have before us the interesting discussion by Dr. Max Gerson, in the New York State Journal of Medicine, July 15, 1941, on Feeding the German Army. In brief, in order to produce endurance, morale and optimum energy availibility, the whole German army has been moved over toward the vegetarian side of diet. This is no aping of the Fuehrer. "...it may be emphasized that the preference for a vegetarian nutrition by the German army is based on extensive fatigue studies by Keller, Eppinger, Kausnitz, Roller and others." (p. 1475). In noticing this same item, Time (July 28) points out, "Since no restrictions are placed on food for the Army, Dr. Gerson thinks that meatless rations are not due to economic necessity, 'but (to) the newer knowledge of the science of nutrition.' German military doctors, for instance, claim that vegetarianism cures neuroses and depression, makes for greater efficiency." Dr. Gerson reminds us that all this is, in immediate terms, for the purpose of destruction of human life. And therein lies the issue. Shall not the democracies, and presently the whole world, be compelled to shift emphasis over to the subtle, the causal, the spiritual and psychic, in short, in order to find that which fits what we claim to be our objective in this struggle ?

Is the soul to be fed on freedom, truth and beauty, the psyche on security, love and trust, while the body is also rightly served ? This cannot be brought about until we set our own house in order, economic, professional, etc. While the German nation explores every means to its ends, our national life is devitalised by a relationship between the profit motive and the ethical motive which cannot be allowed to continue if we are to take leadership. There is an advertisement of the American Meat Institute in American Magazine, September, 1941, p. 5. Upon the advertisement appears a large seal of "acceptance" of the American Medical Association. Naturally, everything in the advertisement is true; and nearly all the implications are false.

The issue in all this is not a particular diet. It is an ethical question (not ethical in the American Medical Association sense), whether a great body of professional men, in that science above all that should be tentative and careful, can afford to stoop in this way ? What kind of word is "acceptance", instead of approval ? If the great body of American Physicians was vocal, and if there was general agreement amongst them that the psyche is real, that spiritual and moral forces arise from laws which embrace and in that sense over-ride psychic and concern even dietetic laws, would not this kind of thing disappear ? And would it not also lead to the entry of doctors as a fine force to alter the social and economic scene for the better ? (A. J. P. - F. K.)

MOTHER LOVE IS MANGANESE Book Notice

The following is a digest of a review by W. F. Ogburn in The American Journal of Sociology, July, 1941, of a book by E. V. McCollum, E. Orient-Keiles and H. G.

Day, Newer Knowledge of Nutrition (Macmillan, 1939, fifth edition).

Thiamine or vitamin B 1, also known as the "morale vitamin," is of such importance that last year experts from the great military establishments of Europe came to a small town in Illinois to study the thiamine content of flour produced in a mill there. Ordinary white flour contains only carbohydrates. Experiments are now reported indicating that vigorous, healthy young people, fed a thiamine deficient diet, become listless, discouraged, and depressed.

Dr. McCollum, of Johns Hopkins University, one of the world's foremost authorities on the chemistry of foods, makes the statement in his book that "mother-love is dependent upon manganese, for mother-rats fed a diet without manganese neglect their young and refuse to suckle them." Note is made that human mothers suffer no lack of manganese in their diet. Other recent experimetns showing that irritability is the outstanding result of a lack of calcium and phosphorus in the diet, suggest that a person cannot be happy in the presence of such a lack. It is not claimed, however, "that an adequate supply of calcium and phosphorus will produce happiness."

Mr. Ogburn, in reviewing Newer Knowledge of Nutrition, suggests that sociology can well afford to widen its scope to include such studies as these because "group behavior and the relation of the individual to the group are at the very heart of sociology." He also comments on the fact that the deficiency theory in nutrition may equal in significance Pasteur's germ theory which "revolutionized medicine and reorganized many of our social habits in regard to human welfare." The deficiency theory besides being a tool to prevent disease is more, in that it "holds out the possibility of a positive improvement in human welfare." (G.B.)

MIND OVER MATTER

In the last war it was "shell shock". Now it is "effort syndrome", a kind of brain and heart malady which incapacitates men for military service. In a report to the Lancet, British Medical Jour., it was shown that every tenth heart case admitted to military hospitals displays the same symptoms. A victim of the malady shows extreme breathlessness and fatigue after slight effort. Disturbances in the pulse rate, dizziness, occasional fainting spells, blurred vision, pain in the chest and numbness in the limbs.

Physical examination showed nothing wrong with the heart or lungs but psychological examination showed a common upbringing in extremely strict and religious homes. They had an exaggerated sense of duty and often an exaggerated patriotism. They were subconsciously worried over failure to live up to their own conceptions of duty. Through a complex mental mechanism this leads to the symptoms of the effort syndrome.

Two common physical conditions are known to have a mental basis, gastric ulcer and colitis. The former condition is most apt to appear in a person who is worried about making a living, the latter in a stingy person who is worried about poverty. The physcial reflexes of worry over duty apparently fall into the same pattern. (New York Times, July 9, 1941. A. J. P.)

ELEMENTARY PARTICLES IN PHYSICS — Conference Report

The Seventh Washington Conference of Theoretical Physics was held in the Capitol May 22-24, 1941. The following extracts from the report by E. Teller of George Washington University, G. Gamow and J. A. Fleming of the Department of Terrestrial Magnetism, Carnegie Institute of Washington, are from Science, July 25, 1941. (The term meson appears to have supplanted the term mesotron. F.K.)

"The topic of the Seventh Washington Conference of Theoretical Physics, May 22 to 24, 1941, was the theory of elementary particles. The elementary particles known at the present time are: The light-quantum; the electron; the proton; the neutron; the positron; the neutrino; and the meson. The rapid development of this field is illustrated by the fact that the last four of these particles were unknown before the last decade. The main subdivisions of the topics discussed at the conference were (1) elementary particles in cosmic rays, (2) elementary particles in nuclei and (3) field theory."

"Sixteen physicists representing eleven universities were invited to act as conveners of the conference. Besides these, eighteen guest-physicists took part, representing twelve universities, government departments and private research organizations. . . ."

"The discussion on the afternoon of May 22 was led by Dr. Oppenheimer. The main topic was the theory of the meson. The meson is a particle discovered in the cosmic rays. The meson has a charge which is equal to the charge of the electron and its mass is intermediate between the masses of the electron and the proton. The meson is not present in the cosmic radiation when it arrives at the earth's atmosphere but is created by some collision between the original cosmic-ray particles and constituents of the atmosphere. The meson is not stable but can disintegrate into some other particles whose nature is not yet established definitely. The existence of the meson and its important role in the structure of the atomic nucleus have been suspected even before the discovery of this particle in cosmic rays. The main problems discussed concerning the meson were the magnitude of its spin or angular momentum and the value of its magnetic moment. . . . . It was suggested that the meson may have the angular momentum but that a change in sign would be connected with the reflections of a meson-wave function in space. This means mathematically that the meson is represented by a pseudo-scalar rather than a scalar. This assumption has important bearing on the meson-theory of nuclear forces and on the theory of the beta-decay, ..."

"On the second afternoon Dr. Wigner was the leader of the discussion. The discussion centered around the structure of more complex nuclei. These nuclei can absorb electromagnetic waves just as atoms do, but while atoms absorb ordinary or ultraviolet light the radiation absorbed by nuclei is of much shorter wave-length and is called gamma-radiation. The question of most interest about this gamma-radiation arises from its unexpectedly small interaction with nuclei. The interaction is much smaller than one would expect . . . . A second question discussed at the same time was concerned with the decay possibility of the beta-active substances. Nuclei showing beta-activity emit either an electron or a positron and in addition a neutrino. The neutron is a particle whose existence has been postulated to avoid contradictions with the law of energy conservation and other conservation laws. . . ."

"The discussion of the third afternoon session was led by Dr. Weisskopf. The main problem was the nature of the forces represented by various fields which have been used both in classical physics and in modern theory. If, as it is assumed at present, nuclear forces are due to emission and absorption of mesons by nuclear particles then it is probable that within the nucleus the classical concept of a

field of forces must be abandoned. But it was brought out at the conference that even one of the oldest field theories---the theory of electromagnetic fields ---is open to serious revision when investigated in small regions of space, particularly when applied in the immediate neighborhood of elementary particles. One of the most radical suggestions that was put forward would abandon completely the concept of a field and would reintroduce instead the idea of interaction of particles at a distance. . . ."

"THE GIANT CYCLOTRON"

"With so much creative human talent employed in devising increasingly powerful engines of destruction it is at least some comfort to know that today in the United States work is proceeding on two of the mightiest instruments the world has seen for the peaceful exploration of the universe. One is the 200-inch telescope nearing completion on Mount Palomar, California; the other is the giant cyclotron under construction at Berkeley, California . . . ."

". . . . The new giant cyclotron will contain over 4,000 tons of steel and copper in its magnet alone and will produce a beam whose voltage will range from 100,000,000 to perhaps 300,000,000. The beam of the largest cyclotron now operating penetrates, in air, about five feet; the beam of this giant instrument will penetrate 140 feet."

". . . . the new giant cyclotron, now under construction, is of critical importance, for it is designed to produce particles so powerful that they can penetrate and explore the nucleus itself."

"It is essential to realize the significance of this point. . . . . Relatively little is known about the nucleus, ... There is evidence that this nucleus possesses a discoverable structure, that it is formed of certain elementary units in accordance with laws with which we are not familiar; . . . ."

"The real case for building a great cyclotron rests upon its ability to make accessible a new infinitesimal world--the interior of atomic nuclei, ..."
(From the President's Review of the work of the Rockefeller Foundation for 1940, Raymond B. Fosdick. R.S.)

HOW TO DODGE LIGHTNING

"The moment a thunderstorm threatens, get into the house, preferably into a large house. This is the advice of Dr. P. L. Bellaschi, in charge of the Sharon high voltage laboratory of the Westinghouse Electric and Manufacturing Company, who has dealt with more than 400,000 strokes of artificial lightning and reviewed the case histories of more than 100 deaths by natural lightning. In the house choose a spot near the center of the room. Stay away from windows, open doors, stoves, pipes, chimney and fireplace. The most dangerous place to be is out in the open. About 90 per cent of lightning casualties occur in rural districts. If no large barn or farmhouse is in sight do not make for a shed, booth or small open barn. Keep away from tall isolated trees, wire fences, poles, tractors and other metal objects. Get away from beaches, swimming pools and fishing ponds. Make for depressions, valleys or dense woods. If you are in your car, it is the safest place. Recently, Dr. Gilbert D. McCann, in charge of Westinghouse lightning studies at East Pittsburgh, sat in a steel-topped sedan while bolts of 3,000,000 volts of artificial lightning repeatedly struck the top. Steel topped busses and trains are equally safe." (Science Supplement, August 29, 1941. R.S.)

THE MALVERN MANIFESTO — The Church of England and Peace

The two Anglican Archbishops, the Cardinal Archbishop of Westminster and the Moderator of the Evangelical Free Church Council joined in 1940 in issuing a statement of the ten points essential to a true peace. They are as follows:

1. The right to life and independence of all nations, large, small, strong or weak, must be safeguarded.
2. Disarmament must be mutually accepted, organic and progressive, both in letter and spirit.
3. International institutions must be created or recast to insure the loyal and faithful execution of international agreements.
4. Real needs and just demands of nations and peoples should be benevolently examined.
5. A peace settlement must be dictated by a sense of acute responsibility which weighs human statutes according to the holy, unshakable rules of divine law.
6. Extreme inequality of wealth should be abolished.
7. Every child, regardless of race or class, should have equal opportunities for education suitable to its peculiar capacities.
8. The family as a social unit must be safeguarded.
9. The sense of a divine vocation must be restored to man's daily work.
10. Resources of the earth should be used as God's gifts to the whole human race and used with due consideration for the needs of present and future generations.

From January 7th to 10th members of the Church of England met at Malvern and issued a Manifesto which is now re-echoing through the churches of the world. The Malvern Manifesto was edited by the Archbishop of York, and is now available as a four page leaflet from The Church League for Industrial Democracy, 155 Washington Street, New York City for five cents. It is the best five cents worth of the month.

The Manifesto opens with an orientation of the church man to the times. In paragraph 11 it comes to grips with the situation. We quote the whole of this: "It is a traditional doctrine of Christendom that property is necessary to fulness of personal life; all citizens should be enabled to hold such property as contributes to more independence and spiritual freedom without impairing that of others; but where the rights of property conflict with the establishment of social justice or the general social welfare, those rights should be over-ridden, modified, or, if need be, abolished." The topics then pursued are: The Proper Purpose of Work and Production; The Existing Industrial Order: A Challenge to Present Practice; The Predominance of the Profit Motive; Tendency to Unemployment and War; The Monetary System; Industrial Management; Trade Balance; Conclusion.

It must be understood that these are not pious sentiments and hopes. The persons associated with this movement are determined to be in on the peace which is to be the birth, just as they have, in England at least, been in and are still being in on the death, of the older order. F.K.

SELF-DISCIPLINE IN A DEMOCRACY, by Charles R. Mann — A Digest

Although our government recognizes both the religious and moral rights of the individual, self-discipline is also necessary to national democracy. We are very

apt to take democracy as a matter of course, merely realizing the negative side of it by refraining from infringement upon other's rights. By constructive action in daily life each one of us should realize the positive side and ensure these rights for his neighbor as well as for himself. Too many of us regard democracy as something already accomplished, not realizing that to make of it a living thing each must contribute his own attitudes and activities. If democracy falls it will not be because of any outside infringement by totalitarian countries, but rather because the individual citizen fails to practice the self-discipline necessary to maintain it.

In our capitalistic economy this need is clearly demonstrated. We must do more than suppress Communist and Fascist attacks. Those who control our economic system should examine carefully their attitudes to discover whether or not each is bent on amassing a private fortune and private ownership instead of holding himself as a trustee to do the greatest good to the greatest number. Because an individual is much schooled he cannot "lay a valid claim to education unless he has acquired sound attitudes and dispositions based upon moral values." If we in America were educated in the true sense of the word there would not be the widespread disruption, crime, graft, etc. from which our nation suffers.

Perhaps the answer to our problem lies in the fact that too large a share of the responsibility for our education is trusted to the schools alone, the result being undue emphasis on intellectual development---only one phase of education. The home, the church, and the community should rank on a par with the school to help each individual realize the absolute necessity of submerging, to some extent, his own interests to those of the common good. If we thus learn to discipline ourselves we will be "able to establish social and governmental controls to which the individual may willingly submit as being in harmony with his inherent human dignity and integrity." In this way will "democracy be made safe for the world." (Journal of Adult Education, April, 1941. G. B.)